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C. S. WAR DEPARTMENT,
NITRE AND MINING BUREAU,
Richmond, Dec. 1, 1863.

NITRE is urgently wanted for the public defence. At present it is the first want of the service. No words can sufficiently impress this want upon the patriotic families of the interior districts, which have been intentionally reserved to meet the military contingencies of the frontiers. The time has now come for a serious and persistent effort. To insure complete success, the first essential is an active co-operation from householders in towns, and from the planting interest in the country—more especially from heads of families. It is surely enough to state earnestly, but very earnestly, a public want of such universal and vital interest, to secure every where a careful reading and patient application of the following notes:

NITRE,

or the nitrate of potash, is well known to be composed of nitric acid and potash, in parts of 54 and 46, very nearly. It is obtained from both artificial and natural sources, but seldom pure. The nitrates of other salts, and especially of lime, are generally used to produce nitre, the substitution of potash for lime being effected by a simple process hereafter to be explained.

The natural deposits occur chiefly in the warmer latitudes or in sheltered localities, and mainly thus: minute crystals penetrating the porous rocks of limestone countries—an incrustation or efflorescence, covering in instances large districts of countries not subject to heavy rains; and in beds of nitrous earth spread over the floors and covering the rock recesses of limestone caves. In the last are found some of the most valuable deposits worked in the Confederate States.

The domestic or artificial sources for the more useful nitrates are very numerous, but are all governed by the same general conditions:

1st. The presence of some mineral base, lime, potash or soda; as supplied in ordinary soils, and especially in marl and limestone countries.

2d. The combinations of nitric acid with the above named bases; the acid in most cases coming from the decomposition of house refuse, animal and vegetable matter, manure and substances containing nitrogen: and, as some contend, directly from the atmosphere. Certain plants, tobacco,

sunflowers, cornstalks and others mentioned in chemical works, are especially useful.

3d. To aid and hasten this decomposition, a close humid atmosphere, but not wet. And to protect the nitre formed from the wind and rain, the presence of buildings, sheds or some covering material is essential.

4th. Time sufficient for the decomposition of materials and the recombination of the chemical constituents of nitre.

From these conditions, it is evident that the most directly available source of home supply, is the collection of nitrous earth from under old dwellings and negro quarters, and also old cattle sheds, stables, slaughter houses, old mortar and plaster heaps, markets, tobacco shops and barns, and in other similar structures, dry and old.

Artificial nitre beds can be prepared according to the well known principles and directions given in Knapp's Chemical Technology, Ure's Dictionary and other works, accessible in every complete public library: also, by applying to authorized agents of this bureau, who will give all known information upon the subject. But in view of immediate results (and the large government establishments for nitre beds), it is earnestly recommended that the attention of the community be first directed, and vigorously, to reducing all nitrous earth that can be found.

In a crisis like our own, the old French Republic derived the larger portion of its nitre supplies from domestic sources. And still many of the European countries encourage and depend upon the same supplies. In Sweden, taxes among the peasantry are paid in saltpetre; and in Prussia, Switzerland and France, nitre beds continue under government auspices.

During the present war, considerable quantities have been obtained from old buildings. In one notable case, among many others, a lady in Roanoke County, Va., whose husband was in the Army, produced 500 pounds from two or three plantation buildings. To obtain similar results on a large scale, it is only necessary to examine earth judiciously, and to persevere patiently, disregarding slight discouragements, and bearing steadily in mind that any quantity, however small, is a patriotic contribution.

There are many chemical tests for nitrous earth, but requiring chemical agents now seldom accessible. In rich earth the presence of nitre is apparent to the taste; and mixed dry with powdered charcoal and thrown on burning coals, it will deflagrate or burn with sparkling and a crackling noise. Ordinary earth, however, can only be tested by following in small quantities the process of manufacture, viz: to drip two or

three bushels of earth, treat with lye, and boil down to crystallization. The resulting long needle-shaped crystals cannot be well mistaken.

* The following directions may be improved upon, according to local necessities; but in commencing with small quantities, the simpler the apparatus, leaching and boiling, the better:

DIRECTIONS FOR WORK.

Scrape up, to the depth of from six to nine inches, all earths supposed to contain nitre. It sometimes penetrates loose earth over eighteen inches. Put this earth loosely into barrels, vats or hoppers, with straw or brush, six inches deep in the bottom of each barrel. If the earth contains much clay, mix in sand to permit a free percolation of water. Place these barrels, &c. where they can be readily filled with water, with a trough along the bottom under the spiggot holes, to receive the drip.

Pour in as much water as the barrels will take. Let the water soak in the earth at least twelve hours, filling up as it settles. When the spiggotts are drawn, let the drip continue until all is exhausted.

Drip each barrel at least twice; and it is better so to arrange them that the second dripping may be made with liquor caught from the first dripping, adding new water when necessary. Warm or tepid water is best. (If barrels cannot be procured, use ordinary lye hoppers.)

It would always be better to pass this same liquor through another barrel of fresh earth; and many persons pass it through three or four barrels of fresh earth, care being taken each time to add sufficient fresh water to carry off the nitrates completely. To convert this solution into nitrate of potash, use common ash lye—thus:

Pour the liquor into a vat or barrel, to be used for this purpose alone; add lye, and the liquor will curdle; allow it time to settle, and then add more lye; and so long as the curdling or clouding continues, lye must be added. The proper proportion of lye can readily be found, by taking one quart of the liquor, and finding how much lye it requires, and then adding in proportion for the barrel. It may be set down as something like an average, that it will require one quart of lye for every four quarts of liquor; but this cannot be taken as a guide; for some earths are stronger than others, and the lye is never of the same strength at any two places. It is merely mentioned to give some idea of the relative quantities.

The lye having been added, and the liquor allowed to settle (it will sometimes take 10 or 12 hours to settle thoroughly), pour off the clear liquor from the top, through a straining cloth, into a large iron pot or

kettle, and boil it down until a drop taken up on the end of a stick and let fall upon a cold surface (such as an axe blade or a plate), will quickly harden or crystallize. Then pour it off, through a straining cloth, into a shallow trough or tub, to shoot. Set it away now in some cool place, and let it remain for 12 or 15 hours, and then collect the crystals, and return the liquor which does not shoot to the kettle to be boiled again. These crystals should be drained and thoroughly dried in the sun, and they are then ready for shipment to the government refinery. During the boiling it will be necessary frequently to fill up the kettles with fresh liquor as it boils down, so that you can have a sufficient quantity for shooting well when boiled down to the point of crystallization.

By leaving out from the above directions the portion referring to ash lye, they are also applicable to the manufacture of saltpetre from tobacco barns. In this case the liquor, just as it comes from the hoppers, is set away to *settle* for 12 or 15 hours. It would even be advantageous to run it through sand or *leached ashes*, simply to *clean* it before boiling. After it has been settled well, or filtered as above suggested, the liquor is boiled down to the point of crystallization, as indicated in the foregoing directions.

Those tobacco barns which have been regularly *swept* from year to year, and the sweepings taken out for manure, will not be apt to contain much nitrous earth. This is especially the case where the floor is of *very hard clay*. But those barns whose floors are of a light, friable earth, or where the ashes (made in firing the tobacco) have been allowed to accumulate, will generally be found rich in nitrous earth.

All nitre or saltpetre thus obtained should be forwarded:

In Virginia, to Nitre and Mining Bureau, Richmond, or to John R. Todd, Saltpetre Refinery, Lynchburg.

In North Carolina, to Capt. C. R. Barney, Greensboro'.

In South Carolina, to Prof. F. S. Holmes, Columbia.

In Georgia, to Prof. N. A. Pratt, Bureau Chemist, Augusta, and Mr. H. P. Farron, Kingston, Bartow county.

In Alabama, Capt. W. H. C. Price, Auburn.

In Florida, Lieut. C. H. Latrobe, Tallahassee.

In Mississippi, Dr. D. R. Lemmon, Jackson.

Further information can be obtained, by communicating directly with these officers.

I. M. ST. JOHN,
Lt. Col. & Chief Bureau.

NOTE.—Some persons may not be able to work steadily in the manufacture of nitre. If such persons would employ rainy days or other inclement weather, for filling their barrels or hoppers, this being the only hard *labor* required, the servants about every country house, under the direction of the ladies, could avail themselves of the milder days for pouring on the water and completing the process.

In sending saltpetre, be particular that the direction is distinct, as this will avoid much confusion. It would be well to write on each box the number of pounds sent, the name of the maker, and his post office; also write by the first mail, giving the same information.



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